

**DRAINAGE REPORT**

**PREPARED FOR**

**EXISTING AND PROPOSED SITE CONDITIONS**

LOCATED AT:

4 FOUR ACRES ROAD

FCE #1706



DARIEN, CONNECTICUT

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**NARRATIVE:**

The subject of this report is a 1.0513 acre parcel located at 4 Four Acres Road in Darien. The purpose of this report is to determine the existing and proposed runoffs resulting from the proposed site improvements in order to design a stormwater management system.

#### EXISTING CONDITIONS:

The subject parcel is located at the east end of Four Acres Road, at the terminus of the cul-de-sac. The lot currently contains a single family residence, and associated driveway, and patio. The lot slopes moderately down from the road to the rear, generally from the west to the east.

Existing soils at this location, as identified in the NRCS Soil Survey of Fairfield County, Connecticut, consist of a combination of Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, which has a Hydrologic classification of "C", and Ridgebury fine sandy loam, 0 to 3 percent slopes, which has a Hydrologic classification of "D".

For the purposes of this analysis a Hydrologic classification of "C" was used.

For the purposes of this analysis, the lot was considered to be vacant as an existing condition.

The existing runoff from a 50-Year rainfall event is 6.23 c.f.s.

#### PROPOSED CONDITIONS:

The proposal for this site is to raze the existing residence and construct a new single family residence with associated driveway and patios. A future pool and pool patio will be accounted for in this analysis.

The proposed runoff from a 50-Year rainfall event is 6.82 c.f.s.

## COMPUTATIONS:

The following computations of the existing and proposed conditions runoff flows were derived from the HydroCAD computer software. HydroCAD follows the NRCS TR-20 procedure for computing stormwater runoff. Computations were performed for a 50-year storm event, which has a 2% chance of occurring in any given 12 month period.

### Existing Conditions:

Lawn	45,798 s.f.	CN 79
Total	45,798 s.f.	

Weighted CN - 79

### Proposed Conditions:

House	4,436 s.f.	CN 98
Driveway	3,895 s.f.	CN 98
Patios	519 s.f.	CN 98
Walks	190 s.f.	CN 98
Pool	686 s.f.	CN 98
Pool Patio	1,412 s.f.	CN 98
Lawn	34,660 s.f.	CN 79
Total -	45,798 s.f.	

Weighted CN - 84

### Groundwater Recharge Volume (GWV):

Impervious area = 24.3 %

WQV =  $(0.2687 * 1.0513 \text{ ac}) / 12 = 0.0235403 \text{ ac-ft} = 1,025.4 \text{ ft}^3$

GWQ =  $1,025.4 * 0.1 = 102.5 \text{ ft}^3$

## SUMMARY:

	100 Year	50 Year	25Yr.	10Yr.	5Yr.	2Yr.
Existing Runoff :	7.23 c.f.s.	<b>6.23</b> c.f.s.	5.24	3.96	3.05	2.00
Proposed Runoff :	7.82.f.s.	6.82 c.f.s.	5.82	4.53	3.60	2.49
Runoff Retained:	1.12 c.f.s.	1.00 c.f.s.	0.88	0.72	0.61	0.47
Areas Bypassing Retention Plus overflow:	7.24 c.f.s.	<b>5.74</b> c.f.s.	4.88	3.76	2.95	2.00

## CONCLUSIONS:

The increased run-off resulting from the proposed site improvements will be retained in an on-site retention system. The run-off from the house roof and the pool patio will be routed to 14 units of Cultec R-330XLHD retention chambers. The increase in stormwater runoff is mitigated on-site.

This system will decrease the net peak run-off during a 50 Year (2%) rainfall event to 5.74 c.f.s. from its current peak of 6.23 c.f.s.

The bottom of the Cultecs will be at elevation 113.0. No restrictive layer was found to an elevation of 111.3.

The proposed retention system provides a total of 1,237 ft<sup>3</sup> of storage, which will be adequate to maintain the net runoff during a 50 Year rainfall event, meets the Water Quality Volume, and will provide groundwater recharge.

The maximum peak net runoff from the proposed conditions decrease or remain unchanged compared to the peak runoff from the existing conditions for each of the rainfall events from the 2 Year to the 50 Year rainfall events, as the table above illustrates.

The proposed improvements will have no adverse impact on surrounding properties.